IN THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the Application:

LISTING OF CLAIMS:

1. (Previously Presented) The data storage system of claim 35, wherein the multiple small form factor magnetic disk drives include:

more than two disk drives having platter sizes less than 3.5 inches in diameter; and
wherein the second-tier RAID control circuitry includes:

a controller that accesses the disk drives having platter sizes less than 3.5 inches in diameter in response to received I/O requests, where said controller simultaneously performs at least a part of at least two write operations onto said more than two disk drives in response to at least two different write requests.

2. (Previously Presented) The data storage system of claim 1, further comprising a device interface to receive I/O requests, wherein the device interface comprises an interface configured to conform to a protocol.

3. (Previously Presented) The data storage system of claim 2, wherein the protocol comprises at least one of the following: SCSI (Small Computer System Interface), Fibre Channel, and INFINIBAND.

4. (Previously Presented) The data storage system of claim 1, wherein the platter sizes comprise platters of at least one of the following sizes: 2.5 inches, 1.8 inches, and 1 inch.

5. (Previously Presented) The data storage system of claim 4, wherein at least one of the disk drives comprises an IDE (Integrated Disk Electronics) drive.

6. (Previously Presented) The data storage system of claim 1, wherein the more than two disk drives having platter sizes less than 3.5 inches in diameter comprise more than two disk having platter sizes 2.5 inches or less in diameter.

7. (Previously Presented) The data storage system of claim 1, wherein the more than two disk drives having platter sizes less than 3.5 inches in diameter comprise more than two disk drives having platter sizes one inch in diameter or less.

8. (Previously Presented) The data storage system of claim 1, further comprising a housing.

9. (Previously Presented) The data storage system of claim 8, wherein the housing has one of the following form factors: standard, half-height, and low-profile.

Claims 10-11. (Canceled)

12. (Previously Presented) The data storage system of claim 1, wherein the RAID data comprises at least one of: a stripe, an error detection code, and an error correction code.

13. (Previously Presented) The data storage system of claim 1, wherein said data storage device is configured to perform cache operations, said data storage device further comprising a cache manager.

14. (Previously Presented) The data storage system of claim 13, wherein the cache manager comprises a manager configured to perform at least one of the following: translate an address of a different storage device to a cache address; cache data included in a write request; load data from the different storage device; and remove cache data.

15. (Previously Presented) The data storage system of claim 1, further comprising a controller card that includes the controller and connections available to couple with more than one storage card that provides access to a least two of the disk drives.

16. (Previously Presented) The data storage device of claim 15, wherein the storage card comprises a card having at least one parallel interface to a collection of the disk drives.

17. (Previously Presented) The data storage system of claim 15, wherein the drives comprise IDE (Integrated Disk Electronics) disk drives.

18. (Previously Presented) The data storage system of claim 15, wherein the connection between the controller and the storage card comprises a serial connection.

19. (Previously Presented) The data storage system of claim 15, wherein the controller comprises a bank interface that routes data requests to the appropriate bank of disk drives.

20. (Previously Presented) The data storage system of claim 35, wherein the set of storage devices includes:

at least one first data storage device having a platter size of at least 3.5 inches in diameter; and

wherein the set of storage sub-devices includes:

more than two disk drives having platter sizes less than 3.5 inches in diameter.

Claim 21. (Canceled)

22. (Previously Presented) The data storage system of claim 20, wherein the platter sizes less than 3.5 inches in diameter comprise platters of at least one of the following sizes: 2.5 inches, 1.8 inches, and 1 inch.

23. (Previously Presented) The data storage system of claim 20, wherein the drives having platter sizes less than 3.5 inches comprise IDE (Integrated Disk Electronics) disk drives.

Claims 24-30. (Canceled)

31. (Previously Presented) The data storage system of claim 35 wherein the first-tier RAID control circuitry and the second-tier RAID control circuitry define a RAID hierarchy.

Claim 32-34. (Canceled)

35. (Currently Amended) A data storage system, comprising:

a set of storage devices, each storage device being configured to store and retrieve data in response to data access commands from a set of external host computers;

first-tier RAID control circuitry coupled to the set of storage devices, the first-tier RAID control circuitry being configured to apply a first RAID scheme on the set of storage devices in a manner that treats the set of storage devices as a first array under application of the first RAID scheme; and

second-tier RAID control circuitry coupled to the first array of storage devices, the second-tier RAID control circuitry being configured to apply a second RAID scheme on a set of storage sub-devices of a storage device of the set of storage devices in a manner that treats the set of storage sub-devices of that storage device as a second array under application of the second RAID scheme;

wherein each storage device of the set of storage devices has at least one magnetic disk drive;

wherein the storage device having the set of storage sub-devices includes, as the storage sub-devices, multiple small form factor magnetic disk drives;

wherein the first-tier RAID control circuitry is adapted to treat each storage device of the set of storage devices as exactly one RAID device when applying the first RAID scheme to store particular data in the set of storage devices; and

wherein the second-tier RAID control circuitry is adapted to treat each storage sub-device of the set of storage sub-devices as exactly one RAID device when applying the second RAID scheme to store a portion of the particular data in the set of storage sub-devices in order to store the particular data in a RAID-within-RAID manner.

36. (New) The data storage system of claim 35, wherein the second-tier RAID control circuitry is electrically coupled subsequent to, and in series with, the first-tier RAID control circuitry, the second-tier RAID control circuitry being further configured to apply the second RAID scheme on the set of storage sub-devices of the storage device of the set of storage devices to store the portion of the

particular data in the set of storage sub-devices (i) after application of the first RAID scheme on the set of storage devices by the first-tier RAID control circuitry and (ii) after receiving the portion of the particular data from the first-tier RAID control circuitry.